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10/572,651	01/18/2007	Aaron Christian Cunningham	47603-002US1	4772
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OCCHIUTI ROLHICEK & TSAO, LLP				EXAMINER
10 FAWCETT STREET				RUBY, TRAVIS C
CAMBRIDGE, MA 02138			ART UNIT	PAPER NUMBER
			3744	
NOTIFICATION DATE	DELIVERY MODE			
06/25/2009	ELECTRONIC			

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/572,651 <b>Examiner</b> TRAVIS RUBY	<b>Applicant(s)</b> CUNNINGHAM, AARON CHRISTIAN <b>Art Unit</b> 3744
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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
 Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 18 January 2007.
- 2a) This action is FINAL.                  2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-22 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-22 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 20 March 2006 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date 3/20/2006
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_.
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_

**DETAILED ACTION**

***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Dual Thermostatic Mixing Valve and Safety Shut-Off Valve.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear which "inlet" and which "outlet" the applicant is referring to in Claim 1 since there is more than one inlet and one outlet.

5. Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what the applicant is referring to with "A liquid mixing valve

according to, said" since it does not give a claim number to reference. For examination purposes, the examiner will assume that Claim 17 is dependent upon Claim 1.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-8, 10-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Yonekubo et al (US4896658).

Yonekubo et al teaches:

**Re Claim 1.** A liquid mixing valve (ref 23), said mixing valve including a first inlet (ref 17) for receiving heated water from a water heater (ref 16), a second inlet (ref 18) for receiving non-heated water from a water supply (Column 1 lines 57-68), a mixing chamber (The location of ref 24 in Figure 2 is indicative of the mixing chamber) for mixing water from said first and second inlets and a discharge outlet (after ref 25 in Figure 2, the water is discharged from the mixing valve but is not specifically labeled) for discharge of said mixed water from said mixing chamber (Figure 2, Column 3 lines 4-23),

a first thermostatic element (ref 24 Figure 2) being disposed within said mixing chamber for controlling the proportions of heated and non-heated water that are mixed within said mixing chamber so that the temperature of the mixed water which is discharged from said mixing chamber does not exceed a predetermined upper temperature (Column 3 lines 24-31);and

whereby, upon increase of the temperature of the mixed water in the mixing chamber above the predetermined upper temperature, the first thermostatic valve is operable to substantially terminate the flow of water through said discharge outlet (Column 3 lines 24-31), said liquid mixing valve further including a safety valve (ref 37) which includes an inlet in communication with said discharge outlet, an outlet, and a flow passage for liquid there between (Figure 8 illustrates that the liquid travels from the mixing valve and to the safety valve, Column 2 lines 29-38, Column 4 lines 23-36, Column 8 lines 25-31), a second thermostatic element (ref 51) disposed in the flow passage and reactable to expand or contract relative to the temperature of liquid flowing past it (Column 4 lines 23-36), a shut off device (ref 52) which is movable with expansion or contraction of the second thermostatic element (Column 4 lines 23-36), the second thermostatic element being operable to shift the shut off device to a shut off position to substantially terminate flow of liquid through the outlet of the safety valve upon failure of the first thermostatic element to substantially terminate flow of water through the discharge outlet when the temperature of the water in the mixing chamber exceeds the predetermined temperature (Column 4 lines 23-36).

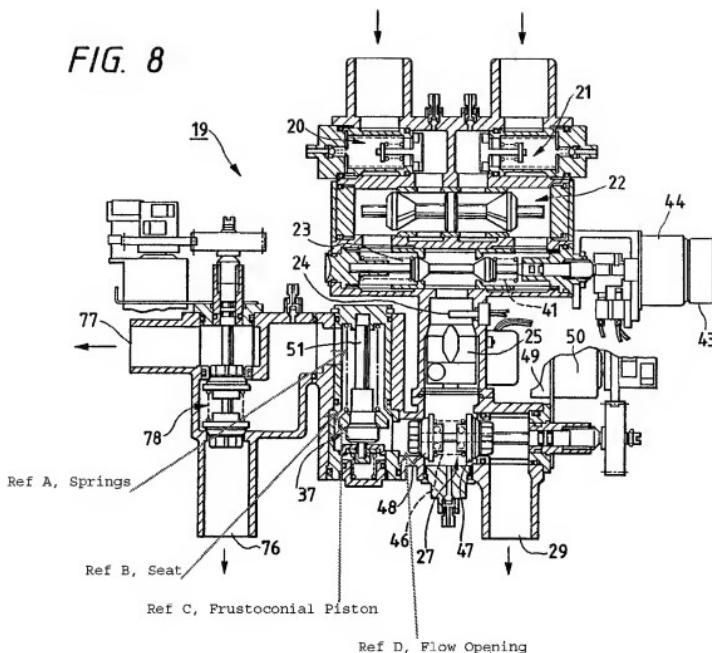
**Re Claim 2.** A liquid mixing valve according to claim 1, said flow passage extending axially between said inlet and said outlet (Figure 3 illustrates that the water discharged from the mixing valve 23 flows in the same direction as the water discharged from the safety valve 37).

**Re Claim 3.** A liquid mixing valve according to claim 2, said flow passage being circular in cross-section (It is inherent and well known in the mechanical arts for pipes to be circular).

**Re Claim 4.** A liquid mixing valve according to claim 3, wherein the diameter of said flow passage changes through the length of said flow passage (Figure 3 illustrates that the flow passage has different diameters).

**Re Claim 5.** A liquid mixing valve according to claim 1, said shut off device (ref 51) including a piston which is positioned in proximity of an opening of said flow passage, for movement toward and away from said opening (Figure 8 below illustrates that the shutoff device is attached to a piston that is activated by the thermostatic element, said shutoff device being located near the inlet ,ref D, to the safety valve, Column 3 lines 35-38, Column 4 lines 23-36).

FIG. 8



**Re Claim 6.** A liquid mixing valve according to claim 5, said piston being arranged to closely approach said opening (ref D in Figure 8 above) (Figure 8 illustrates that the valve 52 is close to the opening, Column 4 lines 23-36).

**Re Claim 7.** A liquid mixing valve according to claim 5, wherein said opening has a valve seat formed about it and said piston can move into engagement with said valve seat to

close said opening (Column 4 lines 23-36, Figure 8 shows that the piston moves the valve 52 into a seat to shutoff liquid supply).

**Re Claim 8.** A liquid mixing valve according to claim 5, wherein said piston is generally cylindrical and includes a conical or frustoconical axial end portion in facing relationship with said opening (Figure 8 above ref C illustrates that the piston has a conical end in relationship with the opening).

**Re Claim 11.** A liquid mixing valve according to claim 1, said shut off device including a piston which is positioned in proximity to an opening formed in said flow passage, said piston being arranged for movement across said opening to restrict flow of water through said opening (Figure 8 above refs B and C illustrates that the shutoff device is attached to a piston that is activated by the thermostatic element, said shutoff device being located near the inlet to the safety valve, Column 3 lines 35-38, Column 4 lines 23-36).

**Re Claim 13.** A liquid mixing valve according to claim 1, wherein said shut off device includes a piston and biasing means to bias said piston to a position allowing generally unrestricted flow of liquid through said safety valve (Figure 8 above illustrates that the shutoff device is attached to a piston that is activated by the thermostatic element, said piston is biased by a spring, ref A in the illustration, the two long lines on each side of the ref 51 are indicative of springs, Column 3 lines 35-38, Column 4 lines 23-36).

**Re Claim 14.** A liquid mixing valve according to claim 1, wherein said shut off device includes a piston which is positioned so that flow of liquid through said flow passage acts on said piston in a direction tending to shift said piston to a position allowing generally unrestricted flow of liquid through said safety valve (Figure 8 above illustrates that the shutoff device is attached to a piston that is activated by the thermostatic element, said piston is biased by a spring, ref A in the illustration, the two long lines on each side of the ref 51 are indicative of springs, Column 3 lines 35-38, Column 4 lines 23-36).

**Re Claim 15.** A liquid mixing valve according to claim 1, wherein said shut off device includes a piston which is positioned so that flow of liquid through said flow passage acts on said piston in a first direction tending to shift said piston to a position to substantially restrict flow of liquid through said flow passage, and biasing means are provided to bias said piston in a second and reverse direction (Figure 8 above illustrates that the shutoff device is attached to a piston that is activated by the thermostatic element, said piston is biased by a spring, ref A in the illustration, the two long lines on each side of the ref 51 are indicative of springs, Column 3 lines 35-38, Column 4 lines 23-36).

**Re Claim 16.** A liquid mixing valve according to claim 15, said biasing means being a coil spring mounted in compression to act on said piston (Figure 8 above illustrates that the shutoff device is attached to a piston that is activated by the thermostatic element, said piston is biased by a spring, ref A in the illustration, the two long lines on each side of the ref 51 are indicative of springs, Column 3 lines 35-38, Column 4 lines 23-36).

**Re Claim 17.** A liquid mixing valve according to, said second thermostatic element including an outer casing (ref 51), a thermally reactive material within said casing, and a plunger, the plunger being movable upon expansion or contraction of said thermally reactive material, said shut off device including a piston and said plunger being in engagement with said piston (ref C in Figure 8 above) to shift said piston upon expansion or contraction of said thermally reactive material (Column 4 lines 23-36).

**Re Claim 18.** A liquid mixing valve according to claim 17, said engagement being fixed engagement (Figure 8 above illustrates that the piston and plunger are in contact with each other, Column 3 lines 23-36).

**Re Claim 19.** A liquid mixing valve according to claim 17, said engagement being abutting engagement (Figure 8 above illustrates that the piston and plunger are in contact with each other, Column 3 lines 23-36).

**Re Claim 20.** A liquid mixing valve according to claim 17, said casing being fixed against movement within said flow passage (Figure 8 above illustrates that the piston is biased by a spring, ref A in the illustration, the two long lines on each side of the ref 51 are indicative of springs which would prevent the casing from movement, Column 3 lines 35-38, Column 4 lines 23-36).

**Re Claim 21.** A liquid mixing valve according to claim 1, said mixing valve being elongate and defining an axial flow passage between one of said first and second inlets, said discharge outlet, said inlet of said safety valve and said outlet of said safety valve (Figure 2 illustrates that the mixing valve inlets and outlets are all in the same axial flow direction, Figure 3 illustrates that the water discharged from the mixing valve 23 flows in the same direction as the water discharged from the safety valve 37, Ref 26 in Figures 2 and 3 indicate that the flow of the mixing valve discharge is in the same axial direction of the safety valve inlet).

**Re Claim 22.** A water delivery system, including a water supply (It is inherent of a hot water supply system, Column 1 line 57, to have a water supply), a water heater (ref 16) and a liquid mixing valve (ref 23, Column 1 lines 57-68),

    said water heater including a tank (ref 16) having an inlet for receiving water (It is inherent to have an inlet for a water supply in a water heater) from said water supply and an outlet (ref 17) for discharge of heated water (Column 1 lines 57-60),

    said liquid mixing valve including:

        a first inlet (ref 17) for receiving heated water from a water heater (ref 16), a second inlet (ref 18) for receiving non-heated water from a water supply (Column 1 lines 57-68), a mixing chamber (The location of ref 24 in Figure 2 is indicative of the mixing chamber) for mixing water from said first and second inlets and a discharge outlet (after ref 25 in Figure 2, the water is discharged from the mixing valve but is not specifically labeled) for discharge of said mixed water from said mixing chamber (Figure 2, Column 3 lines 4-23),

a first thermostatic element (ref 24 Figure 2) being disposed within said mixing chamber for controlling the proportions of heated and non-heated water that are mixed within said mixing chamber so that the temperature of the mixed water which is discharged from said mixing chamber does not exceed a predetermined upper temperature (Column 3 lines 24-31); and

whereby, upon increase of the temperature of the mixed water in the mixing chamber above the predetermined upper temperature, the first thermostatic valve is operable to substantially terminate the flow of water through said discharge outlet (Column 3 lines 24-31),

said liquid mixing valve further including a safety valve (ref 37) which includes an inlet in communication with said discharge outlet, an outlet, and a flow passage for liquid there between (Figure 8 illustrates that the liquid travels from the mixing valve and to the safety valve, Column 2 lines 29-38, Column 4 lines 23-36, Column 8 lines 25-31),

a second thermostatic element (ref 51) disposed in the flow passage and reactable to expand or contract relative to the temperature of liquid flowing past it (Column 4 lines 23-36),

a shut off device (ref 52) which is movable with expansion or contraction of the second thermostatic element (Column 4 lines 23-36),

the second thermostatic element being operable to shift the shut off device to a shut off position to substantially terminate flow of liquid through the outlet of the safety valve upon failure of the first thermostatic element to substantially terminate flow of water through the discharge outlet when the temperature of the water in the mixing chamber exceeds the predetermined temperature (Column 4 lines 23-36).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yonekubo et al (US4896658) in view of Bergmann et al (US5024378, as cited by applicant).

The teachings of Yonekubo et al have been discussed above

**Re Claim 9.** Yonekubo et al fails to specifically teach said shut off device including a piston which is circular in cross-section and is arranged for receipt within a circular opening formed in said flow passage, said circular opening having a slightly greater diameter than the external diameter of said piston so that said piston can enter said opening to restrict flow of water through said opening without fully closing said opening.

Bergmann et al teaches a shut off device including a piston (ref 2) which is circular in cross-section and is arranged for receipt within a circular opening (ref 3) formed in said flow passage, said circular opening having a slightly greater diameter than the external diameter of said piston so that said piston can enter said opening to restrict flow of water through said opening without fully closing said opening (Column 2 lines 16-22).

In view of Bergmann et al's teachings it would have been obvious to one of ordinary skill in the art at the time of invention to include a piston with a small clearance inside the circular opening to Yonekubo et al's safety valve since the small opening allows for a small amount of

hot water to leak out , which cools the water and prevents the thermostatic element from over expanding due to the constant hot water (Bergmann Column 2 lines 22-24).

**Re Claim 10.** Yonckubo et al fails to teach the liquid mixing valve according to claim 9, wherein said piston includes a frustoconical axial end portion in facing relationship with said opening.

Bergmann et al teaches that the piston has a frustoconical axial end as illustrated in Figure 1.

In view of Bergmann et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of invention to include a frustoconical axial end to the piston of Yonehubo since it allows for a gradual reduction of water flow as the piston approaches the valve seat, which allows some water to continue to flow.

**Re Claim 12.** Yonehubo et al fails to teach that the shut off device allows a small amount of liquid to continue to flow past said thermostatic element.

Bergmann et al teaches a shutoff device that allows a small amount of liquid to continue to flow past said thermostatic element (Column 2 lines 16-22).

In view of Bergmann et al's teachings it would have been obvious to one of ordinary skill in the art at the time of invention to allow a small amount of water to seep through Yonckubo et al's safety valve since the small leakage cools the water and prevents the thermostatic element from over expanding due to the constant hot water (Bergmann Column 2 lines 22-24).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TRAVIS RUBY whose telephone number is (571)270-5760. The examiner can normally be reached on Monday-Thursday 7:30-5:00, Friday 7:30-4:00 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Travis Ruby/  
Examiner, Art Unit 3744

6/12/2009

/Frantz F. Jules/  
Supervisory Patent Examiner, Art Unit 3744